Art. XXVI.—*Note on Eucalyptus alpina, Lind., and its Essential Oil.*

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This specimen was discovered by Sir Thomas Mitchell, in 1836, on the summit of Mt. William at an elevation of over 4,000 feet, and, so far, is endemic to Victoria. Until quite within the last year or so, this was the only locality recorded for it, none other being given by Bentham in his "Flora Australiensis," or by Mueller in his "Eucalyptographia," Dec. 11, where this species is figured.

It has, however, now been found by Mr. J. W. Audas to occur at Hall's Gap, in the Grampians, and the leaves from which this oil was obtained were collected "on that portion of the Serra-range lying between Hall's Gap and the Victorian Valley, Grampian Mountains," where it grows on black sandy loam. Mr. C. W. D'Alton, of that locality, informs us that the species seldom grows below an altitude of two thousand feet, and appears to flourish best at about 3000 feet above sea level. The height of the tree is between twelve and thirty feet, being a robust spreading tree, with rough bark at the foot of the trunk and smooth above.

Timber.—The timber is very tough, and stands heavy winds well, but becomes hollow with age.

Remarks.—Being confined to so restricted an area, one would hardly expect to find any variations, and Mueller, who figures and describes it in his "Eucalyptographia," does not give or refer to any. Additional collections of material, however, show that the fruits, at least, really do vary in shape. Those delineated by Mueller might be taken as the extreme in size and contour of rim, which is there shown to be domed, but specimens in this herbarium show the rim to be, even in mature fruits, quite truncate, and in others even half countersunk. The fruit is also occasionally ribbed.

The smaller form of capsule is not unlike that of *E. capitellata* in shape, otherwise the features appear fairly constant.

Essential Oil.—We are indebted, through Mr. Audas, to Mr. C. W. D'Alton, of Hall's Gap, Grampians, Vic., for the material for chemical investigation.

The leaves with terminal branchlets were collected from trees 12 to 30 feet high.

The leaves, which were thick and coriaceous, showed considerable oil glands, but these must have been largely empty, judging from the yield of oil, as this was only 0.36 per cent.

The crude oil, which was thin and mobile, had a terpene-like odour, suggesting that of turpentine. Phellandrene was not detected, and Eucalyptol was only present in small amount. The presence of the solid paraffin peculiar to some Eucalyptus oils (Proc. Roy. Soc., N.S.W., July, 1913) was also determined.

The results show this oil to consist largely of pinene, the laevo-rotatory form predominating slightly. Although belonging to the group of Eucalypts producing a Eucalyptol-pinene oil, yet the species has no commercial value as an oil-producing plant, the yield being much too small, while the oil itself is deficient in oxygen-bearing constituents.

The crude oil had the following characters:—

Specific gravity at 15° C. = 0.8973.

Rotation $a_D = -2.8°$.

Refractive index at 15° C. = 1.4779.

Insoluble in 10 volumes 80 per cent. alcohol, and, owing to the presence of paraffin, not entirely soluble in 90 per cent. alcohol.

The saponification number for the esters was only 2.6, so that esters were only present in very small amount.

On re-distilling the crude oil, the usual amount of acid water and volatile aldehydes for this class of Eucalyptus oils came over below 155° C. (corrected). Between 155° and 163° no less than 66 per cent. distilled.

This fraction, which contained a little Eucalyptol, had the following characters:—

Specific gravity at 15° C. = 0.8669.

Rotation $a_D = -3.9°$.

Refractive index at 15° C. = 1.4678.

This fraction had an odour of turpentine, and gave the characteristic nitrosochloride for pinene, thus showing this fraction to consist largely of that terpene.

Between 163° and 215°, 16 per cent. distilled (14 per cent. below 180°). This fraction, which contained Eucalyptol, gave the following:—

Specific gravity at 15° C. = 0.8783.

Rotation $a_D = -3.2°$.

Refractive index at 15° C. = 1.4680.

Between 215° and 285° only 1 per cent. came over, leaving no less than 16 per cent. in the still, boiling above the latter temperature. This residue contained some paraffin, the remainder consisting, perhaps, largely of polyterpenes.

A portion of the crude oil was distilled to 190° C., and the Eucalyptol determined in this by the resorcinol method. The result showed 10.2 per cent. of Eucalyptol to be present in the crude oil.